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ABSTRACT

Recent models of beginning reading processes are described, and the author offers the following summarization: (1) Models at present focus on cognitive aspects of reading; little attempt has been made to incorporate affective aspects into the models. (2) Several different theoretical positions within psychology representing a wide variety of points of view have been used, whereas transformation-generative grammar is the only theory from linguistics that is represented in recent attempts at model building. (3) There seems to be a rapprochement among theorists toward a view of reading as both a complex cognitive skill, the goal of which is obtaining information, and a complex language system. (4) Most models focus on the reading process per se. However, the opinion is evidenced that in order to understand the acquisition process, we must first study the skill as it appears in final form. (5) Most models of the acquisition phase focus on decoding and its prerequisite abilities. The mechanisms involved in making correspondence between orthography and sound cannot, however, be characterized in terms of simple associative learning. Rather, basic knowledge of language is intimately involved, as well as the utilization of complex active perceptual and cognitive strategies. (Author/AW)

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A REVIEW OF SEVERAL THEORIES AND MODELS OF READING ACQUISITION[1]

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[1]This paper was prepared for the Targeted Research and Development Program in Reading: Right to Read Effort, Phase I. (U.S.O.E.). It was presented at a symposium entitled "Toward the Development of a Model of the Acquisition of Reading Skills" at the meetings of the American Educational Research Association, February, 1971.

Until very recently, there has not been a great deal of interest in the development of a comprehensive theory of reading. Rather, reference to theory and to formulations outside the province of the reading field itself--from psychology, for example--tended to be motivated by an attempt to improve instruction for the beginning reader. Because the focus was clearly on implications for educational practice, it was not so important that "reading" in its entirety be analyzed and put together into one grand scheme. Instead, ideas, general or specific, or methodologies from other fields that looked promising might be borrowed for use in work in reading.

Our focus seems to have changed. Clearly, our ultimate goal is still the improvement of reading instruction. However, what we seem to be working toward at present is the development of a model of reading more geared to the generation of research hypotheses. In fact, we are quickly proceeding to the point where our theoretical formulations--and empirical findings--may become too refined and sophisticated to be of great use in helping to determine instructional procedures. I do feel that we must keep at least part of our attention on the goal of how our models can be applied to instructional problems.

Within the Targeted Research and Development Program in Reading project, I have been reviewing work on cognitive and effective aspects of learning to read. Up to this point, there has been little attempt to incorporate affective factors into reading models, and my review of models this morning will reflect the current

emphasis on the cognitive aspects. I have chosen what I consider to be a representative sample of recent models and shall describe them briefly. They can be classified in a very rough way as behavioral, cognitive, and psycholinguistic. Obviously, there is a great deal of overlap, and some approaches are more difficult to categorize than others. I shall not consider here the earlier descriptive models or the psychometric models, which are being reviewed by others within the Project.

The first sallies into reading by psychologists were, as might be expected, fairly simple. Traditional learning approaches, especially operant conditioning and rote verbal learning, represent the early psychological formulations. The behavioral tradition has already been discussed here, so let me simply note that at times, there is difficulty in trying to draw a sharp distinction between, say, a behaviorist and a cognitivist formulation. This is the case partly because there have been modifications in the approach of certain theorists. Staats is a prime example. We tend to think of him as a leading proponent of the behaviorist point of veww. Indeed, his earliest work in reading (e.g., 1962) was firmly within an operant conditioning tradition. His emphasis on the development of a system of reinforcers, the use of a discrimination-learning apparatus, and the presentation of cumulative records (the particular textual responses not specified) are all within the operant learning tradition.

However, Staats' recent work, while clearly a continuation of his early experiments, has a rather different formulation. A new monograph by Staats, Brewer and Gross (1970) perhaps can be seen as evidence of a growing rapprochement among different theoretical schools. Staats still sees elementary reading as a process

of instrumental discrimination, and he feels that traditional learning principles and experimental techniques, using reinforcement contingencies, are appropriate for the acquisition of reading and for the study of the processes involved. However, he describes reading as a complex, cognitive skill, many of whose components must be developed on the basis of already-learned more basic skills. Moreover, since the process develops slowly, methods involving long-term investigation are needed--that is, detailed study of an experimental-naturalistic nature. Some of these newer notions are very similar to the thinking of psychologists who have quite different theoretical bents.

Another approach with a distinctively "learning" flavor is that of Gagne (1967). According to Gagne, there are eight distinct types of learning, ranging from signal learning to problem-sloving. Each is clearly distinguishable from every other, for it begins with a different state of the organism and ends with a different capability of performance. The eight learning types form a heirarchy, and the prerequisite for almost any one type is that learning of the next lowest type already be established.

Gagne has presented a learning hierarchy for the early stages of reading, the goal of which is decoding, specifically, mastery of the pronunciation rules for regularly spelled words. Later stages of reading would include mastery of the rules for irregularities in the pronunciation of printed words, and following that, a variety of structures involving comprehension. Gagne did not attempt to develop the learning hierarchy for decoding as more than a demonstration of how topics of school instruction are organized hierarchically, involving prerequisite learnings that grow progressively simpler, as one works down from rules to S-R connections.

Wherever on the continuum between "behavioral" and "cognitive" you choose to place Staats or Gagne, there is no questioning the label "cognitive" for the Cornell group's approach. Eleanor Gibson, Harry Levin and others at Cornell provided the impetus for Project Literacy and for much of the theory-based work on the psychology of reading that has resulted over the past few years.

As presented by Gibson (1970) the theory is comprehensive and well elaborated. It is divided into "phases." In the first phase, skills that are fundamental to learning to read are developed, namely, speech and the "graphic act." Since, for the normal child, written material is a second-order symbol system that decodes to speech, some competence in hearing and speaking must come first. The fundamental "graphic act" is scribbling, and the reinforcement for this activity comes from the opportunity to see the marks just made. The child thus develops awareness of graphic features such as continuity and intersection. Learning the distinctive features and shapes of the letters might be called "content learning." Besides that, perceptual development also includes the development of active strategies, such as comparison and systematic scanning.

While Gibson acknowledges that a child must learn to identify the letters of the alphabet, she sees this as an arbitrary and difficult task because it is one of rote memory and is therefore not intrinsically reinforcing. Is decoding, that is, mapping written text to speech sounds, also a matter of paired-associate learning? No, because there is no one-to-one correspondence between sound and orthography. Gibson recommends that training in correspondences be done within a rule-oriented framework, so that children will be able to induce conceptual invariants from a wide variety of examples.

Decoding represents the second phase, and the third and final phase is one of learning rules of unit-formation. As the child becomes more skilled, he will use the structural principles to organize the information available and will be able to read in larger, more efficient units.

An approach heavily oriented toward Piagetian theory has been offered by David Elkind (1967). Elkind concentrates primarily on the perceptual aspects of reading acquisition. His approach is based on the assumption that there are well-differentiated stages of development, and that the learning process(es) manifested by a child depend on his developmental level. Elkind denies the importance of discrimination and association as aspects of perceptual growth. Rather, the perceptual processes that are involved are more complex. They include perceptual reorganization (the ability to rearrange mentally a stimulus array without acting physically on it), perceptual schematization (the ability to organize parts and wholes so that they retain their unique identities without losing their independence), and so forth. Clearly, the same perceptual activities are important at both early and later stages. Rapid reading, for example, requires the ability to explore and anticipate words and sentences. Understanding grammatical structure also requires perceptual exploration and other processes.

While Venezky and Calfee (1970) have presented a model for skilled reading that falls within an information-processing framework, their approach is quite different when they turn to a consideration of the acquisition of reading in its early stages. They focus this model on decoding. Research is designed to assess children's abilities in the several independent, component cognitive skills: visual analytical processes, e.g., how a child recognizes and orders letters, and

acoustic-phonetic analytical processes, e.g., how the child comes to perceive segmentation in spoken features. After these elements are differentiated, they must be associated. Again, this is presumably a far-from-simple process.

Other approaches to theory development emphasize language and the implications of linguistic analysis for reading to a considerably greater extent than the ones I have described. These models, of course, also have much to say about the nature of the psychological processes involved--and what they do say about them is reasonably well in line with other theories.

The application of linguistic knowledge to reading was, until recently, fairly restricted. Bloomfield (1942) and Fries (1963), for example, concentrated primarily on letter-sound correspondences. Lately, the influence of linguists, especially those who work within the transformational-grammar framework, has been very strong. The rejection of the passive, receptive learner for one who is actively constructing his language, the distinction between competence and performance, and most especially the emphasis on analysis of grammatical structure--these and other ideas have helped to lay the foundation for reading models that have a strong linguistic orientation.

Goodman's model (1970) is influenced greatly by transformational-generative theory. For Goodman, reading is a psycholinguistic process, in which the reader decodes from the graphic stimulus not to speech, but directly into deep structure. In oral reading, he decodes, and then encodes the meaning into speech. Comprehension and communication are the goals of reading. Three kinds of information must be utilized simultaneously--graphic, syntactic, and semantic. As reading proficiency improves, the reader, who has more control over language structure, better

conceptual skills, more experience, and better sampling strategies, uses fewer and fewer graphic cues.

Goodman's research strategy is to look at "miscues" in oral reading. Miscues are occurrences of mismatches between the text and the reader's response; they are not errors, because some very good reading may involve miscues--where meaning, of course, is not disturbed. An analysis of the miscues will lead to an understanding of the reader's strategies, and, in fact, instruction should be designed to maximize these sampling and hypotheses-testing strategies, rather than trying to get the child to attend to more specific details of the text.

Goodman's model operates both for the beginner and the proficient reader, but one must not assume that the processes involved are the same. The model is complex, and it can be broken down into several alternative submodels, so that it could represent the beginning reader vs. the skilled, or it could account for differences in an individual reader that would occur as he read material of different levels of difficulty.

Ruddell (1970) and others have also presented models based on what I would call the "psycholinguistic" point of view. They argue that the beginning reader has, and uses, to some extent at least, the abstract rules about language structure. He should be trained so that he can utilize what he knows about language even more effectively in his reading. This means that instruction should stress the conceptual aspects, for concentrating on perceptual aspects would lead to absolute identifications of letters and words, and this would interfere with mature reading strategies.

I want to describe one additional model, of a very different and unusual type, that is called a transactional theory. Rosenblatt (1969) studied adult's reactions as they read poems. She stresses that it is the quality of the experience the reader is living through, under the stimulus of the text, that is the goal of the reading, and that there is an active, two-way relationship between reader and text. The "transaction" terminology developed by Dewey and Bentley underscores the importance of both elements in a dynamic relationship. The active seeking-out of particular aspects of the text, and the tentative interpretations and reinterpretations makes this closely related to the more typical cognitive view. However, Rosenblatt contrasts this aesthetic mode of reading with "instrumental' reading, or reading primarily for information to be used after the reading event, not for the experience during the actual reading.

It is interesting to speculate what implications the reading teacher might draw from this transactional theory. Goodman's recommendations that guessing strategies be promoted might need revision, at least in certain instances, in view of the fact that whatever the cues may be for "aesthetic" reading, they will certainly be subtle and complex. Substituting <u>little</u> for <u>small</u> may be of no importance in reading a set of directions, but in a poem it might be disastrous.

After reviewing the theories I have described here, it seems to me that we have achieved a fairly good consensus as to an overall view of reading. I think it would be most profitable now <u>not</u> to emphasize further elaboration and formalization of these comprehensive models. Rather, I would like to see us turn our attention to certain limited areas and attempt to refine certain notions that at this point need sharpening. We need "partial" models that are specific, rigorous, and testable.

As the theories are presented now, there are not too many well defined questions that, if evaluated in the laboratory or in the classroom, would provide a critical test of any of the theories. The biggest and clearest distinction that has been made, of course, is that between reading as a passive process, with the graphic input cuing directly and automatically the already-learned and therefore instantly-meaningful speech code; and on the other hand, reading as an active, cognitive skill, involving complex strategies of information-selection and processing. At this point, little serious consideration is given to the first alternative. Even Thorndike (1917) declared that the comprehension of textbooks was "far above the level of merely passive or receptive work." We are now past the point where, in talking about proficient reading, the active-passive distinction is worth belaboring.

Consideration of the distinction between the active and passive nature of reading is important, on the other hand, in attacking problems of acquisition. Here, I think, the new focus within psychology on cognition and the analyses of language will lead to some genuinely new insights. The rejection of a simple associative-learning model for orthography-sound correspondence learning reflects the acknowledgement that a great many tasks are more profitably evaluated as "active" processes. Even in simple paired-associate and serial learning, the subject shows evidence that he has organized and coded the material. Staats' emphasis on the concept formation paradigm and Gibson's emphasis on induction of conceptual invariants reflect this point of view.

Our task of model-building is complicated significantly by the fact that the learner is a child, in the process of development. In fact, at about the time

when most children begin reading, there are fundamental changes in what they can learn, and perhaps how they can learn. From varied evidence such as Vygotsky's work on the increasing ability with age to conceptualize, the increasing ability to integrate information based on different sensory inputs, and work on discrimination and reversal learning, White (1965) suggests that the years from five to seven may mark a crucial transition in quantity and quality of thinking.

Does in fact the child pass through developmental stages during which different learning processes nnd strategies are available to him? If so, we must take these fundamental differences into account in our models of reading acquisition. Most reading theorists, with the exception of Elkind, have not taken up this position. The issue is of course a very general one, and different points of view will likely lead to important distinctions in model-building and research in reading.

I'd like to take a minute to summarize what I've said here: (1) Models at present focus on cognitive aspects of reading; little attempt has been made to incorporate affective aspects into the models.

(2) Several different theoretical positions within psychology, representing a wide variety of points of view, have been used, whereas transformation-generative grammar is the only theory from linguistics that is represented in recent attempts at model-building.

(3) There seems to be a rapprochement among theorists toward a view of reading as both a complex cognitive skill, the goal of which is obtaining information, and a complex language system.

(4) Most models focus on the reading process <u>per se</u>. This is due in large part, of course, to the theorists' specific interest in skilled reading. However,

the emphasis on proficient reading is also a result of the opinion that in order to understand the acquisition process, we must first study the skill as it appears in final form.

(5) Most models of the acquisition phase focus on decoding and its prerequisite abilities. The mechanisms involved in making correspondences between orthography and sound cannot, however, be characterized in terms of simple associative learning. Rather, basic knowledge of language is intimately involved, as well as the utilization of complex active perceptual and cognitive strategies.

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